



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,352	06/14/2006	Wei Zhu	20296-002US1 OP050050	2233
26211	7590	12/10/2008		
FISH & RICHARDSON P.C. P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022				
EXAMINER				
ABDALLA, KHALID M				
ART UNIT		PAPER NUMBER		
4173				
NOTIFICATION DATE		DELIVERY MODE		
12/10/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

# Office Action Summary

**Application No.**

10/565,352

**Applicant(s)**

ZHU ET AL.

**Examiner**

KHALID ABDALLA

**Art Unit**

4173

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/US)  
Paper No(s)/Mail Date 01/19/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 101***

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-10 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The methods in claims (1-10) fail to fall within a statutory category of invention they are directed to a software logic which is non-statutory subject matter. For a method claim to satisfy the 35 U.S.C. 101, it must (1) be tied to another statutory class or (2) transform the underlying subject matter. Claims (1-10) are not tied to another statutory class and do not transform the underlying subject matter.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyer et al (US 20030133412) in view of Weinstein et al (US 20020191572) hereinafter referred to as Lyer and Weinstein respectively.

Regarding claim 1, Lyer discloses a method of supporting a multi-port (associated ports see [0016] and [0027]) virtual local area network (VLAN) with a multi-protocol Label switch (MPLS), wherein the VLAN includes a MPLS table item managing module(MPLS-enabled routers and LSP are connected to the VLANs see [0023]) and the method comprises steps of:

establishing a label switch path (LSP) through a label distribution protocol (LDP), and obtaining information binding a forwarding equivalence class (FEC) (assigning equivalence class see [0033]) and a label or information binding an ingress label and an egress label, and an address of a LDP peer entity at an opposite end, which is a next-hop IP address ( the transmission of data occurs over LPS and be distributed using LDP and each packet encapsulates and carries the label from ingress router to the egress router see [0010] and abstract.)

the MPLS table item managing module creating a forwarding-relation table, and adding a forwarding-relation table item based upon the obtained information ( Each subsequent router examines the port label of the received packet and replaces it with the outgoing label and forwards it see [0037]).

Lyer does not disclose the 'obtaining an egress port corresponding to the forwarding-relation table item based upon the next-hop IP address; and accomplishing the MPLS via the egress port. However Weinstein teaches the forwarding-relation table item based upon the next-hop IP address (next hop label forwarding entries (NHLFE) see [0066]); and

accomplishing the MPLS via the egress port (forwarded within the domain by using the label at the egress point see [0067] ). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use and modify the method of Lyer and couple with the labels forwarded via egress point taught Weinstein in order to forward packets.

Regarding claim 2, note that Lyer discloses the method, wherein the step of the MPLS table item managing module (MPLS-enabled routers and LSP are connected to the VLANs see [0023] ) creating the forwarding-relation table and adding the forwarding-relation table ( Each subsequent router examines the port label of the received packet and replaces it with the outgoing label and forwards it see [0037]).

Also not that Weinstein teaches a forwarding-relation table item of FTN for a label edge router (LER) in the VLAN, which indicates a mapping of a forwarding equivalence class (FEC) to a next-hop label forwarding entry (NHLFE) (an FEC-To-NHLFE (FTN) map is used for label creation. At each intermediate LSR, an Incoming Label Map (ILM) converts incoming labels into corresponding NHLFEs to converts the MPLS packets accordingly see [0066] ); and creating an forwarding-relation table item of Incoming Label Map (ILM) for a label switch router (LSR) in the VLAN, wherein the forwarding-relation table item of ILM (Incoming Label Map (ILM) converts incoming labels into corresponding NHLFEs to converts the MPLS packets accordingly see [0066] )indicates a mapping of an input label to the NHLFE.

Regarding claim 3, note that Lyer modified by Weinstein teaches the

method, wherein the step of obtaining the egress port (Weinstein: forwarded within the domain by using the label at the egress point see[0067]) corresponding to the forwarding-relation table item based upon the next-hop IP address (Weinstein: next hop label forwarding entries (NHLFE) see [0066]) further comprises steps of: the MPLS table item managing module (Lyer: MPLS-enabled routers and LSP are connected to the VLANs see [0023]) searching an address resolution protocol (ARP) table based upon the next-hop IP address to judge whether there is a corresponding table item of ARP (Lyer address resolution protocol see [0042]); if there is a corresponding table item of ARP, establishing a correspondence relation of the forwarding-relation table item and a corresponding egress port and physical MAC address in the table item of ARP based upon information of the corresponding egress port and MAC address (Lyer packets arrival with IP destination address see [0042] also see [0038]); and if there is no corresponding table item of ARP, marking the forwarding-relation table item with an UNAVAILABLE sign (Lyer: not directly on the network see [0041]), and obtaining information of the egress port with a data flow which triggers a corresponding action based upon an actual data flow (Weinstein: forwarded within the domain by using the label at the egress point see[0067]).

Regarding claim 4, note that Lyer modified by Weinstein teaches the method wherein the step of obtaining the information of the egress port (Weinstein: forwarded within the domain by using the label at the egress point see[0067]).

with the data flow if there is no corresponding table item of ARP . and further comprises the steps of :

transmitting an ARP (Lyer : address resolution protocol see [0042]) broadcast request in the VLAN based upon the next-hop IP address(Weinstein: next hop label forwarding entries (NHLFE) see [0066] ) and an egress interface VLAN

receiving an ARP response message sent from the opposite end;

relearning and obtaining the egress port and MAC address (Lyer: physical address see [0042] corresponding to the next-hop IP address based upon the received ARP(Lyer : address resolution protocol see [0042]) response message sent from the opposite end, and

a maintaining and managing module of the VLAN notifying the MPLS table item managing module to update the information of the egress port corresponding to the forwarding-relation table item based upon the received ARP (Lyer: address resolution protocol see [0042]).

Regarding claim 5,note that Lyer discloses the method wherein further comprising steps of:

the MPLS table item managing module distributing the relevant forwarding-relation table (each subsequent router examines the port label of the received packet and replaces it with the outgoing label and forwards it see [0037]). item to the maintaining and managing module to create the forwarding-relation table maintained by the maintaining and managing module (MPLS-enabled routers and LSP

are connected to the VLANs see [0023]) also see Each subsequent router examines the port label of the received packet and replaces it with the outgoing label and forwards it see [0037]).

Also note that Weinstein teaches the maintaining and managing module maintaining a correspondence relation of the next-hop IP address (next hop label forwarding entries (NHLFE) see [0066] and the forwarding-relation table item.

Regarding claim 6 ,note that Lyer discloses the method , wherein the step of the MPLS table item managing module distributing the relevant forwarding-relation table item to the maintaining and managing module(Lyer: MPLS-enabled routers and LSP are connected to the VLANs see [0023] also see Each subsequent router examines the port label of the received packet and replaces it with the outgoing label and forwards it see [0037] AND [0026] ).

further comprises steps of:

for the LER in the VLAN ( LER on the VLAN see [0026], the MPLS table item managing module sending the information of the forwarding-relation table( Each subsequent router examines the port label of the received packet and replaces it with the outgoing label and forwards it see [0037] ); item of FTN to the maintaining and managing module

Also note that Weinstein teaches the MPLS table item managing module sending the information of the forwarding-relation table item of ILM (Incoming Label Map (ILM)



converts incoming labels into corresponding NHLFEs to convert the MPLS packets accordingly see [0066] ) to the maintaining and managing module.

Regarding claim 7, note that Lyer modified by Weinstein teaches the method, wherein the step of the maintaining and managing module (Lyer: MPLS-enabled routers and LSP are connected to the VLANs see [0023]) maintaining the correspondence relation of the next-hop IP address (Weinstein: next hop label forwarding entries (NHLFE) see [0066] ) and the forwarding-relation table (Lyer: Each subsequent router examines the port label of the received packet and replaces it with the outgoing label and forwards it see [0037] ) item further comprises steps of: when an ARP is deleted, the maintaining and managing module notifying the MPLS table item managing module to update the forwarding-relation table item related to the ARP (Lyer: address resolution protocol see [0042] and setting an INVALID (not on network see [0041] ) and (Lyer: address resolution protocol see [0042]) flag bit for the forwarding-relation table item related to the ARP.

Regarding claim 8, note that Lyer discloses the method, wherein the step of setting the INVALID ( not on network see [0041] and (address resolution protocol see [0042]) flag bit for the forwarding-relation table item related to the ARP (address resolution protocol see [0042]) further comprises steps of: in a distributed forwarding system, notifying micro-codes to set the INVALID ( not on

network see [0041] and (address resolution protocol see [0042])

flag bit for the forwarding-relation table item in the micro-codes (program constructs a VLAN-ID table in LAN switch see[0044]) which is related to the ARP; and  
in a non-distributed forwarding system, the MPLS table item managing module setting the INVALID flag bit for the forwarding-relation table item which is related to the ARP (address resolution protocol see [0042]).

Regarding claim9,note that Lyer modified by Weinstein teaches, wherein the step of the maintaining and managing module maintaining the correspondence relation of the next-hop IP address (Weinstein next hop label forwarding entries (NHLFE) see [0066]) and the forwarding-relation table item further comprises steps of:  
when an ARP is newly created, the maintaining and managing module searching the forwarding-relation table maintained by itself as to whether there is a table item related to the ARP(Lyer: address resolution protocol see [0042]);  
if not, no process being performed, otherwise judging whether a new egress port (Lyer new egress router pass the labels on the packets see [0051] )is consistent with the egress port corresponding to the original forwarding-relation table item; and if consistent, maintaining the original forwarding-relation table item, otherwise notifying the MPLS table item managing module to update the information of the egress port corresponding to the forwarding-relation table item ( Weinstein forwarded within the domain by using the label at the egress point see[0067]).

Regarding claim 10, Lyer discloses The method, wherein in a distributed forwarding system, the method further comprises a step of converting the forwarding-relation table item created by the MPLS table item managing module (MPLS-enabled routers and LSP are connected to the VLANs see [0023] also see Each subsequent router examines the port label of the received packet and replaces it with the outgoing label and forwards it see [0037]). into a format required by micro-codes and distributing the forwarding-relation table item to the micro-codes (program constructs a VLAN-ID table in LAN switch see[0044]).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KHALID ABDALLA whose telephone number is (571)270-7526. The examiner can normally be reached on MONDAY THROUGH EVERY OTHER FRIDAY 7 AM TO 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JINHEE LEE can be reached on 571-272-1977. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. A./  
Examiner, Art Unit 4173

/Jinhee J Lee/  
Supervisory Patent Examiner, Art Unit 4173